

The listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1.-12. (Cancelled).

(13) (Currently amended) An apparatus for controlling an optical wavelength of a control target light outputted from a variable wavelength light source, comprising:

an optical diffraction ~~unit~~ means for diffracting the control target light entered from the variable wavelength light source into a direction corresponding to the optical wavelength of the control target light;

a periodic signal generation ~~unit~~ means for detecting a diffraction light diffracted by the optical diffraction ~~unit~~ means and generating periodic signals with a phase varied according to a diffraction direction of the diffraction light; and

a phase detection ~~unit~~ means for detecting a phase difference between a phase of the periodic signals and a phase corresponding to a reference optical wavelength, and controlling the variable wavelength light source by feeding back the phase difference to the variable wavelength light source such that the optical wavelength of the control target light is controlled by an optical frequency pulling with respect to the reference optical wavelength according to the phase difference.

Second Response

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(Divisional Application of Application No. 09/296,082)

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14. (Currently amended) The apparatus of claim 13, wherein the periodic signal generation unit means generates the periodic signals by using a photo-detector array in which the phase of the periodic signals is varied depending on a photo-detector cell of the photo-detector array which detected the diffraction light.

15.-21. (Cancelled).

(22.) (Original) A method for controlling an optical wavelength of a control target light outputted from a variable wavelength light source, comprising the steps of:

 diffracting at an optical diffraction device the control target light entered from the variable wavelength light source into a direction corresponding to the optical wavelength of the control target light;

 detecting a diffraction light diffracted by the optical diffraction device and generating periodic signals with a phase varied according to a diffraction direction of the diffraction light;

 detecting a phase difference between a phase of the periodic signals and a phase corresponding to a reference optical wavelength; and

 controlling the variable wavelength light source by feeding back the phase difference to the variable wavelength light source such that the optical wavelength of the control target light is controlled by an optical frequency pulling with respect to the reference optical wavelength according to the phase difference.

23.-24. (Cancelled).